

Cuno-639.1
Serial No. 10/669,533

PATENT
June 1, 2005

In the Claims:

1. (currently amended) A filter element, comprising:
a filtration media;
an upstream filtration media support positioned upstream from and in contact
with ~~said~~the filtration media; and
5 a multi-layer downstream filtration media support positioned downstream
from ~~said~~the filtration media, ~~said~~the multi-layer downstream support including a first
downstream support layer and a second downstream support layer, wherein:
~~said~~the first downstream support layer is in contact with ~~said~~the
filtration media and is interposed between ~~said~~the filtration media and ~~said~~the second
10 downstream layer, ~~said~~the first downstream support layer is fabricated so as to
minimize points of surface contact with ~~said~~the filtration media; and
~~said~~the second downstream support layer is in contact with ~~said~~the
first downstream support layer and is fabricated so as to facilitate lateral fluid flow
relative to ~~said~~the multi-layer downstream pleat support, wherein ~~said~~the second
15 downstream support layer comprises an extruded apertured film having ribs.
2. (Original) A filter element as recited in Claim 1, wherein the filtration
media is a pleated filtration media having a plurality of longitudinally extending pleats.
3. (Original) A filter element as recited in Claim 2, wherein the
longitudinally extending pleats of said pleated filtration media are selected from the group
consisting of radial pleats, w-pleats and spiral pleats.
4. (Original) A filter element as recited in Claim 1, wherein the filtration
media is a microporous filtration membrane having a pore size of from about 0.1 microns to
about 10 microns.
5. (Original) A filter element as recited in Claim 1, wherein the filtration
media is fabricated from a material selected from the group consisting of Teflon, nylon,
polyaramide, polyvinylidene difluoride, polyether sulfone and combinations thereof.
6. (Original) A filter element as recited in Claim 1, wherein the multi-layer
downstream support consists of said first downstream support layer and said second
downstream support layer.

Cuno-639.1
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7. (Original) A filter element as recited in Claim 1, wherein said first downstream support layer is fabricated from a nonwoven material.

8. (Original) A filter element as recited in Claim 7, wherein said nonwoven material is laminated to said filtration media.

9. (Original) A filter element as recited in Claim 7, wherein said nonwoven material is fabricated as a spunbond, spunlace, airlaid or wetlaid material.

10. (Original) A filter element as recited in Claim 7, wherein said nonwoven material is fabricated from polypropylene, polyester or polyamide.

11. (Original) A filter as recited in Claim 1, wherein said second downstream support layer is an extruded apertured element.

12. (currently amended) A filter element, comprising:
a filtration media;

an upstream pleat support positioned upstream from and in contact with ~~said~~the filtration media; and

5 a multi-layer downstream pleat support positioned downstream from ~~said~~the filtration media, ~~said~~the multi-layer downstream support including at least a first downstream support layer and a second downstream support layer, wherein:

~~said~~the first downstream support layer is in contact with ~~said~~the filtration media and is interposed between ~~said~~the filtration media and ~~said~~the second downstream layer, ~~said~~the first downstream support layer is fabricated so as to minimize points of surface contact with ~~said~~the filtration media; and

10 ~~said~~the second downstream support layer is in contact with ~~said~~the first downstream support layer and is fabricated so as to facilitate lateral fluid flow relative to ~~said~~the multi-layer downstream pleat support, wherein ~~said~~the second downstream support layer comprises an extruded apertured film having ribs.

15 13. (currently amended) A filter cartridge comprising:

a filter element having a longitudinal axis, an outer periphery and an inner periphery, and including a filtration media; an upstream filter media support positioned upstream from and in contact with said filtration media; and a multi-layer downstream support positioned downstream from ~~said~~the filtration media, ~~said~~the multi-layer

Cuno-639.1
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downstream support including a first downstream support layer and a second downstream support layer, wherein:

10 the first downstream support layer is in contact with ~~said~~the filtration media and is interposed between ~~said~~the filtration media and ~~said~~the second downstream layer, ~~said~~the first downstream support layer being fabricated so as to minimize points of surface contact with ~~said~~the filtration media; and

15 the second downstream support layer is in contact with ~~said~~the first downstream support layer and is fabricated so as to facilitate lateral fluid flow relative to ~~said~~the multi-layer downstream filter media support, wherein ~~said~~the second downstream support layer comprises an extruded apertured film having ribs;
a perforated cage surrounding the outer periphery of the filter element;
a perforated core surrounded by the inner periphery of the filter element; and
end caps enclosing both ends of the perforated cage.

14. (Original) A filter cartridge as recited in Claim 13, wherein said first downstream support layer is fabricated from a nonwoven material.

15. (Original) A filter cartridge as recited in Claim 14, wherein said nonwoven material is laminated to said filtration media.

16. (Original) A filter element as recited in Claim 14, wherein said nonwoven material is fabricated as a spunbond, spunlace, airlaid or wetlaid material.

17. (Original) A filter element as recited in Claim 14, wherein said nonwoven material is fabricated from polypropylene, polyester or polyamide.

18. (Cancelled) A filter element as recited in Claim 1, wherein said second downstream support layer is an extruded apertured element.

19. (Cancelled) A filter element as recited in Claim 1, wherein said second downstream support layer is an extruded apertured element having ribs formed on one side.

20. (Original) A filter cartridge as recited in Claim 13 wherein the perforated cage is equipped with end caps at both ends thereof.

21. (Original) A filter cartridge as recited in Claim 13 wherein said perforated core is a cylindrical core and is coaxially positioned within the filter element

Cuno-639.1
Serial No. 10/669,533

PATENT
June 1, 2005

which is a cylindrical filter element and the cage is likewise cylindrical and is coaxially positioned about the cylindrical filter element.

22. (currently amended) A filter cartridge comprising:

a filter element having a longitudinal axis, an outer periphery and an inner periphery, and including a filtration media; and a multi-layer downstream pleat support positioned downstream from ~~said~~the filtration media, ~~said~~the multi-layer downstream support including a first downstream support layer and a second downstream support layer, wherein:

the first downstream support layer is in contact with ~~said~~the filtration media and is interposed between ~~said~~the filtration media and ~~said~~the second downstream layer, ~~said~~the first downstream support layer being fabricated so as to minimize points of surface contact with ~~said~~the filtration media; and

the second downstream support layer is in contact with ~~said~~the first downstream support layer and is fabricated so as to facilitate lateral fluid flow relative to ~~said~~the multi-layer downstream pleat support, wherein ~~said~~the second downstream support layer comprises an extruded apertured film having ribs;

a perforated cage surrounding the outer periphery of the filter element;
a perforated core surrounded by the inner periphery of the filter element; and
end caps enclosing both ends of the perforated cage.